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The Impact of Gender on Attitude Towards Computer Technology and E-Learning: An Exploratory Study of Punjab University, India

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Abstract: Technological advancement has led to important changes in the way education is being imparted. Evolution of internet and advancement in computer technology has led to new approaches in learning and training which are referred to as e-Learning. This study aims to understand the relationship between gender and attitude towards e-learning. Literature shows that gender plays a key role in understanding the differences in perception towards usefulness of technology and ease of use but with regards to attitude and perception towards e-learning diverse views have been presented. This paper analyses the effect of gender on attitude towards computer technology and e-learning collectively. It also analyses the impact of gender on the usage of the basic e-learning forms like uploading/downloading course content, interactive videos and pod casting. A questionnaire was developed to collect the necessary data. Scale on Computer and e-learning attitude (SCAELA) was constructed and validated. In this study 477 students enrolled in various courses across many departments in Panjab University Chandigarh were analyzed. The results showed that no significant relationship exists between gender and attitude towards computer and e-learning. The usage of various e-learning forms also showed a non-significant relationship with gender. The future developments in e-learning can take note of this finding while developing e-learning tools which are efficient.

Key words: attitudes towards e-learning, gender effect, attitude towards computers

I. INTRODUCTION

The evolution in the field of modern information communication technologies (ICTs) has revolutionized the areas varying from language pedagogy, language learning to language use. Teaching and learning strategies in education have been radically revised with the aim of providing better service to the learners through the intensive use of the ICT. The information technology in teaching and learning has created a need to transform how students learn by using more modern, efficient, effective and cost-effective alternatives in the form of e-learning. An e-learning environment acts as an interface between the students and their learning objectives. It provides different means to achieve the learning goal of students. The e-Learning environment can be accessed by using a web browser over the Internet or Intranet. It supports several learning strategies and different ways of interaction, communication and collaboration-learning. It is deployed with the objective of enhancing students' knowledge and saving the cost. e-learning helps in reaching geographically dispersed groups, to provide "anywhere-anytime" learning, to provide consistency, to ensure compliance with regulations, and to improve productivity etc.

Educational institutions use e-learning for broadening the academic scope. e-learning provides much more references and learning scopes than the ones provided in the usual text books. Using e-learning portal can be of great help. Class assignments can be assigned to the students and also submitted back through this interface. e-learning is also associated with the new ways of learning that are more cost efficient than traditional learning strategies. It also allows students to take better control of the process of learning. This research builds a multiple approach to examine individuals' attitude towards computer technology and e-learning. Taking gender as criteria this research focuses on examining the attitude towards computer technology and e-learning.

II. REVIEW OF LITERATURE

e-learning is defined as an Internet-enabled learning process (Gunasekaran et al, 2002). Homan and Macpherson, (2005) and Sambrook (2003) in their research used the term e-learning to cover any electronic learning material from CDROMs on stand-alone PCs to intranet/internet networked systems with downloadable and interactive material. e-learning has undergone three distinct generations. The first generation from 1994-1999 was marked by the passive use of the Internet where traditional materials were simply reformatted to an online format. The second generation i.e.

from 2000-2003 was marked by the transition to higher bandwidths, increased resources and the move to create virtual learning environments. The third generation that started from 2004 was marked by the incorporation of greater collaboration, socialization, project-based learning and reflective practices (Connolly and Stansfield, 2007).

Various researches to study the effect of demographical variables such as ownership of PC, gender, age, academic qualifications, and skill and use of the computer and Internet etc on the attitude of students towards e-learning have been carried out (Katz et al. 1995; Shashaani, 1997; Francis, 1993; Roca et al. 2006; Paris, 2004 and Bertea, 2009) . Egbo et al (2011) in their research concluded there is the tendency that female students would accept ICT use more than their male counterparts. Contrary to this Liaw & Huang (2011) in their results demonstrated that male students have more positive e-learning attitudes than female students. They also suggested that computer related experience is a significant predictor on learners' self-efficacy and motivation toward e-learning. Bebetsos and Antoniou (2009) in their study indicated that gender differences exists for "affect" and "perceived usefulness", whereas no gender differences were indicated for attitude towards Physical activity. Cheng (2006) in his research found that demographical variables such as gender, computer skills and school system remained insignificant. Experience of applying e-learning for business courses played a key factor in affecting the level of acceptance among students. He also indicated positive attitude of the students about e-learning. Keller and Cernerud (2002) have identified variables such as age, gender, previous experience of computers, technology acceptance and individual learning styles as major predictive factors when discussing acceptance of technology by students. Thus the study aims to analyze the effect of gender on attitude towards computer technology acceptance and e-learning.

Internet as a medium for uploading and downloading of course content is an important part of e-learning platform (UAF e-learning 2012-2013). Zhang et al (2006) inferred that Students in the e-learning environment that provides interactive video achieve significantly better learning performance and a higher level of learner satisfaction than those in other settings. The findings suggest that integrating interactive instructional video into e-learning systems is important. Walls et al (2010) in their study had concluded that students may not be as ready or eager to use podcasting for repetitive or supplemental educational purposes as much as we think they are, but they could be persuaded. Hence it also aims to investigate the level of use of various e-learning forms by the students in Panjab University that are being researched previously.

III. RESEARCH OBJECTIVES AND HYPOTHESIS

A. Objectives of the study:

1. To analyze the effect of gender on Scale on computer and e-learning attitude (SCAELA) of students.
2. To analyze the effect of gender on use of e-learning forms.

B. Hypothesis of Study

H1: There is a significant gender difference in scale on computer and e-learning attitude.
H2: There is a significant gender difference in use of e-learning forms viz. Uploading/ Downloading content, Interactive educational video and Pod casting.

C. Period of Study

The study was carried out from July 2012 to Oct 2012 for collection of data and analysis.

IV. RESEARCH AND METHODOLOGY

A. Participants

The study employed a survey approach to examine e-learning attitudes of the students. The target population was the students studying in the Panjab University, Chandigarh, India. A total of 500 questionnaires were distributed among various faculties of the university. It included Faculty of Arts, Faculty of Science, Faculty of Business Management, Faculty of Engineering, and Faculty of Law. The departments covered in the five faculties were over 10.

B. Measurement

The first section focused on the demographic profile of the respondents such as name, sex, age, and faculty. This was followed by questions on computer activities related to e-learning forms. The survey presented to the students was constructed to measure the attitude of students towards computer technology and e-learning on Likert scale. Loyd and Gressard (1984) computer Attitude Scale & 'The Attitude towards Computer Instrument (ATCI), developed by Shaft et al (2004) were referred but were modified for the purpose of current study. The section contained seventeen questions that covered variables on attitude towards computer/computer technology as well as e-learning thus the scale was named as

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Scale on Computer And e-learning Attitude (SCAELA). This was specially made and validated for the oriental part of world since no previous researcher had made a scale for measuring computer and e-learning attitude.

V. DATA ANALYSIS

A. Overview of data gathered

A total of 500 questionnaires were distributed, on final scrutiny 23 were dropped because they were incomplete and the remaining 477 questionnaire were retained for the further analysis. Thus the response rate was over 95% which is an exceptionally good rate. Table 1 illustrates the overview of the sample profile. The questionnaire data was analyzed using SPSS and Microsoft Excel and the subsequent data analysis were undertaken using statistical approach i.e. independent sample t-test and one-way ANOVA.

B. Data Analysis

Section one discusses about demographic characteristics, i.e. gender, age, faculty of study. The sample size under study had students from all the major faculties of Panjab University. The distribution of males and females in the sample survey was more or less balanced with 45.1 % males and 54.7 % female. Majority of the respondents of the survey were below the age of 26 years. 33.5 % were less than 20 years and 62.7 % were between 20-26 years. (Table 1)

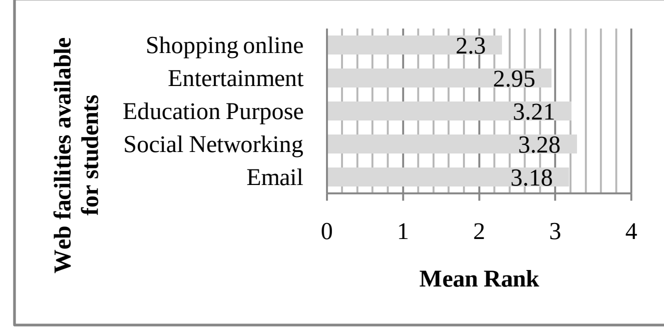
Table 1: Demographic Details

Descriptive Statistics	No of Respondents	Percentage
Faculty		
Arts	93	19.5
Business Management	175	36.7
Engineering Technology	72	15.1
Law	74	15.5
Science	63	13.2
Gender *		
Male	215	45.1
Female	261	54.7
Age*		
Less than 20	160	33.5
20-26 years	299	62.7
26-30 years	8	1.7
Above 30 years	4	0.8

*N≠477 due to unmarked fields by respondents (Treated as Missing values in spss)

The research also reveals that social networking is the most used web facility by the students, followed by using web for educational purpose.

Table 2: Ranking of web facilities



Email and Entertainment stand at rank three and four. Online shopping is ranked the least by most of the respondents. (Table 2)

With respect to the use of e-learning forms the survey shows that majority of the respondents i.e. 89 % have uploaded/downloaded the course material and content from internet. It suggests that the students are already well adapted to this e-learning format. An interactive education video over internet was also seen by over 68 % of the respondents for some course. It suggests that majority of students find it a possible method of learning. Pod casting that refers to listening of lectures using i-pods or digital music players. In the survey only 22 % students had ever tried pod-casting as medium of learning. This suggests that audio modes of e-learning are not yet familiar amongst students as compared to audio visual modes like videos or presentations.

A chi-square test of independence was performed to examine the relation between gender and e-learning tools of uploading and downloading course content/presentation. (Table 3)

Table3: Relationship between gender and e-learning tools/forms

Question	Response	Gender		Total	Mean	Std Dev	Chi Square
		Male	Female				
Do you upload/ download course material/ presentations over the internet?	Yes	184	233	417	1.12	.323	1.778 df=1 0.182
	No	20	26	56			
Have you ever watched an interactive educational video over the internet?	Yes	143	181	324	1.32	.465	0.509 df=1 .476
	No	71	78	149			

Have you tried pod-casting (listening to lectures using i-pod/ digital music players)	Yes	51	55	106	1.78	.417	0.454 df=1 .500
	No	163	204	367			

A non significant relationship between the activity to upload/ download course material/presentations over the internet and gender was found [$\chi2$ (2, N = 473) = 1.778, p >.05(.182)]. Relationship between gender and use of interactive educational video was also found to be non significant [$\chi2$ (2, N = 473) = .509, p >.05(.476)]. A non significant relation between gender and use of podcasting was noted. [$\chi2$ (2, N = 473) = .454, p >.05(.500)].

The scale constructed for assessing computer and e-learning attitude (SCAELA) was factor analyzed. The scale had four further factors after PCA with varimax rotation i.e. Sentiments towards computer/computer technology, Attitude towards e-learning, Perceived usage of computers and Physical presence of teacher. The four factors together resulted for 58 % variance which is near 60 % expected value. The fourth factor due to insignificant correlation with the other three was dropped.

Table 4: Rotated Component Matrix[a]

		Component			
		1	2	3	4
V2.1	I feel at ease learning about computer technology	**.715**	.218	.062	.124
V2.2	I am the type to do well with computer technology	**.790**	.138	.159	-.069
V2.3	The thought of using computers is not frightening	**.777**	.124	.025	.049
V2.4	I do not feel threatened by the impact of computer technology	**.759**	.089	.017	-.112
V2.5	I feel comfortable about my ability to work with computer technology	**.716**	.112	.244	-.036
V2.6	I like working with computers	**.629**	.244	.341	.091
V2.7	Once I get on the computer I find it hard to stop	.141	.151	**.562**	.266
V2.8	I would choose to use a computer in my spare time	.083	.064	**.773**	.220
V2.9	I prefer to use a computer to write my assignments	.167	.175	**.699**	-.238
V2.10	I would choose to use computers in my teaching	.254	.427	**.462**	-.186
V2.11	e-learning is a suitable alternative to the pen/paper based system	.161	**.616**	.327	-.353
V2.12	With e-Learning my course will be more enjoyable	.269	**.695**	.227	-.143
V2.13	Class notes of any lectures will be easily accessible even if I miss one	.108	**.591**	-.052	.330
V2.14	With e-learning I would interact more with other students	.135	**.759**	.094	.117
V2.15	Studying through online medium will help me retain more	.172	**.757**	.161	-.071
V2.16	Physical presence of teacher is extremely essential for learning the course	.002	.010	.145	**.809**
V2.17	More topics can be covered less time by use of e-learning as compared to conventional medium of blackboard and notes.	.079	**.683**	.087	.034

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

The hypotheses to see the gender difference on scale of computer and e-learning attitude were tested by using independent t-test.

Table5: Gender difference on scale of computer and e-learning attitude

		Levene's Test of homogeneity				
		F	Sig.	t	df	Sig. (2-tailed)
Attitude towards e-learning	Equal variances assumed	2.864	.091	-.007	473	.994
	Equal variances not assumed			-.007	431.860	.994
Sentiments towards computer/ computer technology	Equal variances assumed	4.111	.043	1.781	473	.076
	Equal variances not assumed			1.749	413.742	.081

Perceived usage of computers	Equal variances assumed	8.175	.004	-.144	472	.886
	Equal variances not assumed			-.141	408.110	.888

The test of homogeneity for attitude towards e-learning had equal group variances (p = .091>.05) and unequal group variances for sentiments towards computer/computer technology (p=.043<.05) and perceived usage of computers (p=.004<.05). The t-test revealed that p-value for factor on attitude towards e-learning at p<0.05 level [t = - .007, p = 0.994], for factor on sentiments towards computer/computer technology [t = 1.749, p = 0.081] and perceived usage of computers [t = -0.141, p = 0.888] is greater than .05 thus the null hypothesis was accepted. There is no significant gender difference in scale on computer and e-learning attitude.

VI. CONCLUSIONS

In general, the results of this study show that students of Panjab University are well versed with the latest tools and forms of e-learning and have high rate of access to internet. The study fulfilled the objective of understanding the impact of gender on computer attitude, e-learning attitude and usage of various e-learning forms. The results are in line with works of Katz et al. (1995) and Paris, (2004) that there is no difference between the attitudinal scores of males and females. The results also show that the various forms of e-learning are known to the students of university. The hypothesis tested to see the effect of gender on forms of e-learning also showed that the usage of tool/forms of e-learning has no impact of gender. This implies the university can think about applying the e-learning format as the students irrespective of their gender are receptive towards the various forms of e-learning.

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